



Safety Information Bulletin

CAAS SIB No.	2016-02
Issued	10 March 2016
Subject	Use of Erroneous Parameters at Take-off
Ref. Publications	1) EASA SIB No.: 2016-02
Applicability	All Singapore Air Operator Certificate (AOC) Holders
Description	CAAS draws the attention of AOC holders to the potential safety risk related to the use of erroneous mass data or take-off performance data for various types of aircraft.

Several investigation reports and studies have highlighted a safety issue related to erroneous mass data or take-off performance data. EASA, in SIB No.: 2016-02, raises awareness of potential errors induced by flight crew when entering data into the Electronic Flight Bag (EFB) or Flight Management System (FMS) during flight preparation phase. EASA highlighted that the main contributing human factors to such errors were time pressure and task interruptions. In most cases, the flight crew had entered inadequate values for take-off mass, v-speeds or thrust. The following list provides examples of common errors involving the calculating and entering of take-off performance data into the FMS:

- a) the Zero Fuel Weight (ZFW) is inadvertently used instead of the Actual Take Off Weight (ATOW) in calculating performance data; an incorrect value is selected from the load sheet or take-off data card;
- b) the aircraft weight is incorrectly transcribed or transposed into an aircraft system or when referencing performance manuals;
- c) the Centre of Gravity (CG) value is incorrectly transcribed or calculated;
- d) take-off reference (V) speeds are incorrectly transcribed or transposed when manually entered into FMS or aircraft systems;
- e) aircraft data from a previous flight is used to calculate the take-off reference (V) speeds;
- f) take-off performance parameters are not updated as a result of a

change in operational conditions, for example, a change in the active runway or condition (wet, contaminated, etc.), departure from a runway intersection, change in the wind conditions, ambient temperature, temporary runway length restrictions, etc.;

- g) wrong performance charts are used;
- h) the wrong table or column/row is inadvertently selected in the performance charts;
- i) an incorrect value is used when referencing the performance charts;
- j) an error is made when converting values into the required unit of measurement;
- k) wrong slats/flaps setting is used compared to the calculated take-off performance;

The following are the possible mitigation elements that can be implemented:

- a) Flight crew procedures and training related to take-off parameters calculation, verification methods, common errors, contributing factors and error trapping;
- b) Flight crew training related to the identification of inadequate take-off performance and the initiation of appropriate actions;
- c) Aircraft systems software performing automated gross error checks of values entered and computed.

Recommendation(s) Singapore AOC holders are highly encouraged to use the reference publication and the following recommendations:

- 1. Management system:** It is recommended that operators consider the risk related to the use of erroneous take-off parameters. A dedicated safety risk analysis and assessment should be conducted to evaluate if the procedures in place are adequate or if additional/alternative mitigations should be defined. In particular, the following scenarios should be analysed with respect to the probability of:
 - a) using wrong reference data for computerised performance calculation;
 - b) making errors in mass and balance or take-off performance calculation;
 - c) incorrect transcription of data to avionic systems (e.g. incorrect

transcription to the FMS);

- d) incorrect loading of the aircraft;
- e) using erroneous weather/runway data; and
- f) inefficient cross-checking between flight crew.

Note: the effects of workload, time pressure, and fatigue should be considered when studying the scenarios above.

2. Flight crew training: It is recommended that operators emphasise, during initial and recurrent flight crew training, the following:

- a) Prevention: consider the issue in the context of Crew Resource Management training, as well as raising flight crew awareness on the issue of automation overreliance and the need to conduct appropriate consistency checks (e.g. mental gross error check, the pilots should know a few rules of thumb to detect large inconsistencies, and be encouraged to apply them during the pre-flight check, cross check of the EFB outputs).
- b) Situational awareness during take-off roll to ensure detection of erroneous take-off parameters. (e.g. low acceleration, sluggish and/or nose heavy rotation, rough idea of the runway position where V1 or Vr should be passed).

Note: In order to avoid negative training, the user should verify the adequacy of the used Flight Simulation Training Device(s) and its qualification level.

- c) Raise/ascertain flight crew awareness on possible recovery measures (e.g. apply TOGA).

3. FDAP: It is recommended that operators define and implement specific FDAP events relevant to the monitoring of take-off performance issues in their FDAP programmes. Some suggestions can be found in the list of documents referenced in EASA SIB 2016-02.

Singapore AOC holders are also encouraged to contact their respective Principal Operations Inspectors (POIs) to share any additional information regarding this issue.

Contact(s)

For further information, contact respective POIs or CAAS A/FO Division Infocenter at 6595 6764 or CAAS_AFO_Infocenter@caas.gov.sg